Report to ONR Coastal Dynamics Program: Travel to ONR IFO and FWG demonstrating New Seabed Data Systems, June 2003

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Brief:

a. Between the dates of 18-27 June 2003 Dr Chris JENKINS visited ONR IFO (London) and a series of German institutions.
b. The purpose was: (i) to formulate plans to improve the seabed mapping which supports naval Mine Countermeasures and Acoustic Prediction systems in Europe and the US, (ii) gather views on what are the priorities for supply and future development.
c. The travel was funded by the Office of Naval Research (Arlington) and this is the report required by that grant.
d. Dr Thomas WEVER of FWG (Kiel) was the principal host.

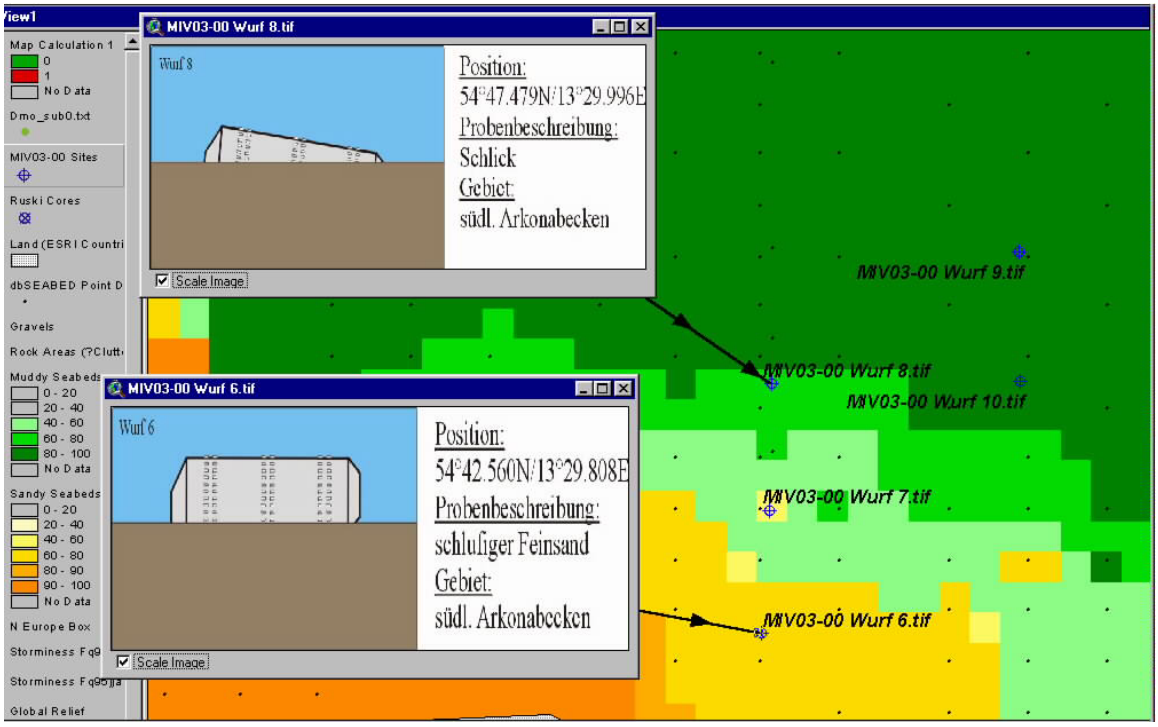

Figure 1. During the visit to FWG ideas were swapped on how experimental results and seabed mapping might be better integrated. For example, the 200 or so mine impact experiments soon available to ONR MBP scientists form a good teaching set to guide models and expert systems. This is a prototype display of what might be available to naval planners from such work.

B. Schedule:

Date		Actions	Topics covered
19 June 2003	ONR IFO London	Brief ST-MBA (NATO Mine Burial Spec. Team) on dbSEABED; contribute to group discussions	Uncertainty of seabed data, sediment transport, mine burial mechanisms
	NATO NG/3 ST-MBA	Presentation 1 "*dbSEABED: A new generation of Seafloor Data System"*	A short description of the seafloor data system, focussed particularly to the provision of geographically varying, validated numeric inputs to Mine Burial Prediction models and expert systems.
20,22 June 2003	London	Discussions with Dr T Wever	Discussed some of the tactical environmental requirements of German Navy, FWG and others in relation to seabed character.
23 June 2003	FWG, Kiel	Visit FWG; detailed technical discussions with Dr Wever, Dr. Ivor Nissen, Mr. Michael Unger	Created a prototype Baltic Sea coverage of seabed character including "rule of thumb" classifications for impact, scour/bedform and liquefaction burial; built interactive GIS interfacing of impact burial experimental results with maps of sediment properties.
		Presentation 2 "*An Explanation of dbSEABED with Emphasis on Naval Applications*"	An overview of dbSEABED, its data handling, information processing of numeric and word-based data types, types of tactical displays. Attended by many FWG personnel plus representatives of the German Navy, in mine countermeasures, sonar performance, anti-submarine warfare, hydrographic charting (GE Hydrogr. Office, BSH).
24 June 2003	FWG, Kiel	Technical discussions with FWG	Discussion of interface with acoustic range prediction models Safari / Moccasin and perhaps BLUG.
	GEOMAR, Kiel	Presentation 2 "*A New Generation Seabed Database and Applications in Research"*	A description of dbSEABED with special attention to global coverages, the use of word-based data and possibilities of using it in conjunction with geophysics.
25 June 2003	IOW,	At Institut fuer Ostseeforschung	An 'agreement in principle' was reached to cooperate in the

	Warnemunde	Warnemuende (IOW), with Dr Jan Harff (Director, Marine Geology)	building of a Baltic Sea seafloor mapping; IOW would assist with data discovery/entry and generation of novel data products.
		Presentation 2 "*dbSEABED: A Novel Seabed Information System*"	Attended by IOW staff plus representative of German Navy Office (Rostock), Mr Walter Offenborn
26 June 2003	FWG, Kiel	Visit FWG; detailed technical discussions with Dr Wever and Dr Nissen (manager of environmental data base)	Formulation of schedule of actions for the future including components of delivery of a system to Germany, strengthening of Baltic and North Sea digital data coverages; intention to begin trialling via a MOU between FWG and INSTAAR.

C. Contacts and discussions made:

a. Dr Thomas Wever, FWG: Discussions and planning of supply of dbSEABED to German navy institutions; initially of a demonstration (probably in ESRI Arc Explorer) for the German Navy intranet.
b. Dr Ivor Nissen FWG: Detailed discussion on the format of dbSEABED and existing FWG seabed data structures. Ivor will implement a German defence intranet demonstration of dbSEABED. Also, the intention was made to interface dbSEABED outputs to Safari / Moccasin seafloor classes and formats including BLUG.
c. Dr Michael Unger, FWG: Progress was made on the importation of data from Nautical Digital Charts (NDC) into dbSEABED, to allow integration of that data with German sets.
d. Dr Warner Brückmann, GEOMAR: He hosted the seminar at GEOMAR.
e. Prof Jan Harff, IOW: Extensive discussions regarding potentially collaboration, the data systems which IOW has in place, their target-proxy concept for interpolation of site data.
f. Dr Thomas Leipe, IOW: Inspection of multicorer and physical properties sediment laboratories
g. Dr Christiane Kuhrts, IOW: Mud transport under Wave conditions; based on MOM 3 hydrodynamic model; applies mainly surficial to 'fluff'.
h. Dr Bjorn Bohling, IOW: Critical Shear Stress measurements made recently in Baltic Sea, their use a 'teaching data set' in dbSEABED.
i. Dr Rolf Thiele, Director, FWG: Brief introduction and explanation of our visit.
j. Dr Berndt Borbertz, IOW: Demonstrated the IOW target-proxy concept, involving calculation of bottom erodability under situations where there is data on the presence of benthos; also involves indicator kriging. He will forward a digital manuscript ASAP.
k. Staff from the Navy Hydrographic Office, Hamburg: We discussed possible incorporation of additional datasets and foreshadowed a visit to there later in 2003.

D. Comments made by Navy after talks

a. Talk at FWG (Monday, June 23, 10:30)

- 9 officers of the Navy from: Navy Office (plus 1 civilian: Dr. Marion Behrends ♀); Fleet Command (ASW, MCM); Mine Hunting Flotilla; Navy Operations School; a representative from the German Hydrographic Office (Bundesamt für Seeschifffahrt und Hydrographie, BSH, Hamburg).
- Responses from them (except ♀):
    + One officer was impressed by the amount of data in the Baltic Sea and said: "that is more than we actually have at the Navy".
    + Another one said: "get it, test it – but get it".
    + Internal discussion after the discussion revealed several ideas how to use the info of dbSEABED.
    + A submariner asked the question about connection to other systems ("Not another laptop in the operations centre").

+ Others were concerned about the direct input of dbSEABED data into models (sonar range prediction, mine burial models). Ideas discussed among officers were to black out areas of high burial risk for different burial mechanisms to leave those areas of "good mine huntability".
+ "Can be used for planning ahead of operations and at sea".
+ Acting Deputy Director of FWG "If it is good, we should get and test it" ... "...money is not the issue..."
+ Later that day and the next day many FWG scientists expressed their surprise how well the systems seemingly works. Even those without geo-contacts saw a great advantage of dbSEABED.

- The German Hydrographic Office representative:
  + Offered BSH data from a seafloor sediment map (so-called Figge-Karte after the author Figge) of the inner German Bight sector of the North Sea for inclusion in goSEABED (or euSEABED ?).
  + Is very interested in a visit of you and possibly presentation at the BSH in Hamburg.

b. Talk at GEOMAR (Tuesday, June 24, 16:15)

- No really important questions here but high degree of interest and realisation of the use for GEOMAR data/cores. Special interest in combination with video-observations and their implementation into the data.

c. Talk at IOW (Institut für Ostseeforschung Warnemünde), Wednesday, June 25, 10:30)

- Prof. Jan Harff (Head of Marine Geology Section), Dr. Bernd Bobertz, Dr. Bernd Bohling, Dr. Christiane Kuhrts, Dr. Thomas Leipe
- Mr Walter Offenborn (Navy Office, Head of Geo-Info Seafloor; responsible for advising all ships going to an operation and supplying them with seafloor information; also for Q-routes and surveys, works closely with STN-Atlas on their data base).
- All very interested and surprised how well the data handling seems to work. Highly interested in cooperation. Impressed by the fast incorporation of the Russian data and the Pangaea data (was criticism of Pangaea format, particularly extraction process).

E. Conclusions

a. A high level of interest was seen amongst naval staff and research institutions in the system.
b. Preliminary agreement was reached to trial the system in detail in German Naval and University institutions, beginning immediately.
c. A substantial amount of advice was given on the highest priorities for interfacing dbSEABED with defence systems – mine burial, acoustic range prediction.